

# The Swiss Master in Chiropractic Medicine Curriculum: Preparing Graduates to Work Together With Medicine to Improve Patient Care



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## ABSTRACT

**Objective:** In 2007, chiropractic became 1 of the 5 medical professions in Switzerland. This required a new chiropractic program that was fully integrated within a Swiss medical school. The purpose of this article was to discuss the Master in Chiropractic Medicine (MChiroMed) program at the University of Zürich, including advantages, opportunities, and challenges.

**Discussion:** In 2008, the MChiroMed program began with its first student cohort. The MChiroMed program is a 6-year Bologna model 2-cycle (bachelor and master) “spiral curriculum,” with the first 4 years being fully integrated within the medical curriculum. A review of the main features of the curriculum revealed the advantages, opportunities, and challenges of this program in comparison with other contemporary chiropractic educational programs. Advantages and opportunities include an integrated curriculum within a university, medical school, and musculoskeletal hospital, with their associated human and physical resources. Many opportunities exist for high-level research collaborations. The rigorous entrance qualifications and small student cohorts result in bright, motivated, and enthusiastic students; appropriate assessments; and timely feedback on academic and clinical subjects. Early patient contact in hospitals and clinical facilities encourages the integration of academic theory and clinical practice. The main challenges faced by this program include difficulty recruiting a sufficient number of students because of the rigorous entrance requirements and curriculum overload resulting from undertaking a full medical curriculum and chiropractic modules.

**Conclusions:** The MChiroMed program is a unique chiropractic curriculum that integrates medical and chiropractic education within a spiral curriculum at a world-class Swiss university medical school. The expectation is that graduates, with their expanded diagnostic and therapeutic knowledge, skills, and experience, will become future experts in primary spine care in Switzerland. It is hoped that this curriculum model will be adopted by other countries and jurisdictions seeking to enhance the role of chiropractic in health care. (*J Chiropr Humanit* 2016;23:53-60)

**Key Indexing Terms:** *Chiropractic; Curriculum; Education; Profession; Interdisciplinary Studies*

## INTRODUCTION

The history of the chiropractic profession in Switzerland is a compelling story of strong opposition from the medical community and considerable adversity overcome by the excellent organization and dogged determination of chiropractors, patients, and later the general public.<sup>1</sup> This tenacity resulted in Switzerland becoming the first country in Europe to regulate chiropractic.<sup>1</sup>

In 2007, a new law was passed to make chiropractic 1 of the 5 recognized medical professions, which also include human medicine, dental medicine, veterinary medicine, and pharmacology.<sup>2</sup> Chiropractic, which was severely persecuted by organized medicine in its beginnings in Switzerland, became included by law as “chiropractic medicine.”<sup>1</sup> The new status of chiropractic mandated a Swiss chiropractic program within a medical faculty at a Swiss university. In 2008, the first chair for chiropractic medicine was appointed at the Faculty of Medicine at the University of Zürich, and the first cohort of chiropractic medicine students began their studies at the university.<sup>3</sup>

The Swiss university program follows on the success of the Danish chiropractic program at the University of Southern Denmark. Chiropractic in Denmark has a similar story of opposition, negativity, and refusal by the medical profession to cooperate and collaborate with the “unscientific health care cult” of chiropractic. Myburgh and Mouton provided an interesting account of the development of

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chiropractic education in Denmark that parallels the Swiss experience.<sup>4</sup>

Chiropractic's new status comes with increased privileges and responsibilities. Chiropractors are now responsible for a level of patient diagnosis and clinical workup similar to that provided by medical doctors. Consequently, chiropractors' scope of practice includes the right to order all diagnostic imaging and most laboratory testing. Chiropractors now have limited prescription privileges, which include non-narcotic analgesic, anti-inflammatory, and muscle relaxant medications.<sup>2,3</sup>

We hope that the chiropractic medicine graduates in Switzerland will be a new breed of chiropractor, being educated in a curriculum that integrates the best of chiropractic with the best of human medicine. Chiropractic graduates' advanced clinical knowledge, skills, and experience will allow them to collaborate (ie, work closely together in care delivery) and integrate (ie, be part of an organized structure) within medical and health care teams in a variety of multidisciplinary settings and, importantly, manage a wide variety of spinal pain conditions.<sup>5</sup>

In North America, a growing movement advocates that chiropractors become the "primary spine care specialists."<sup>6,7</sup> Since 2008, the chiropractic medicine program at the University of Zürich has positioned itself to be the model curriculum for chiropractors to become the primary spine (and extremity) care specialists. The purpose of this article was to discuss the Master in Chiropractic Medicine (MChiroMed) program at the University of Zürich and its advantages, opportunities, and challenges.

## DISCUSSION

### Master of Chiropractic Medicine Program

The purpose of the 6-year MChiroMed program is to enable students to acquire the knowledge, skills, and attitudes necessary for entry into the 2-year mandatory postgraduate program; engage in safe, competent, and effective supervised practice; and prepare to function in an integrated manner with all other specialties of medicine.

The 6-year chiropractic medicine program is integrated within the human medicine curriculum at the University of Zürich. The University of Zürich medical curriculum follows the Bologna model, consisting of 2 cycles (bachelor and master) of 3 years each. As part of the medical school and its curriculum, chiropractic medicine students must be accepted into the medical school at the same level as other medical students. The main qualification for entrance is passing the rigorous 9-hour written medical aptitude examination at a sufficient level, which is determined each year by the number of applicants compared with the available openings to study medicine. The competition to study medicine at the University of Zürich is fierce, and this presents a substantial challenge to recruitment of prospec-

tive chiropractic medicine students who successfully pass the examination at a level high enough to enter the medical faculty. Generally, only 1 in 4 prospective students is accepted into the first year of human medicine. Of the 300 available places to study medicine, 20 to 24 have been allocated to chiropractic medicine.

The chiropractic medicine curriculum teaches students science-based the medical and chiropractic knowledge and skills that form the foundation of the practice of chiropractic medicine. Chiropractic students study the full 4 years of the human medicine program. In addition, they are taught the knowledge and skills specific to chiropractic medicine in mandatory modules (Mantelstudium) in each of the 4 years. During the last 2 years of the 6-year program, the curriculum is heavily focused on subjects related to chiropractic medicine. At the end of year 3, successful chiropractic students earn the Bachelor of Medicine (BMed; Schwerpunkt Chiropraktik) degree; at the end of year 6, they earn the MChiroMed degree.

The professor of chiropractic medicine was responsible for designing and developing the chiropractic medicine curriculum. As of September 2008, the official start of the program, he was also the program's only employee. Fortunately, his doctoral degree was in medical education, and he had over 20 years of experience in chiropractic education, including over 10 years designing and developing numerous chiropractic programs and having them accredited/validated.

The major educational challenge facing the MChiroMed program was integration of the chiropractic curriculum within the first 4 years of the existing master of medicine (MMed) curriculum. Chiropractic students were required to take 4 full years of medicine courses, and chiropractic courses needed to be added and integrated into the curriculum. The MMed program contained "core" and "optional" courses for years 1 to 4. For chiropractic students, the "optional" subjects were, in fact, mandatory chiropractic courses. The chiropractic-specific teaching hours per week are 2, 4, 6, and 7 hours, respectively, for years 1 to 4, and each class contains a mini-introductory lecture followed by a practical class. A revision of the medical curriculum took place in 2014. Since that time, the number of hours of lectures has been reduced in favor of active learning, such as practical classes and clinical placements. Generally, 40% of the MMed program consists of lectures, and 60% comprises more active learning. The curriculum of the MChiroMed program varies from 60% to 80% practical classes, with classes increasing in the later years of the program. The details of these chiropractic courses will be discussed later.

The MChiroMed curriculum used a reverse-engineering design whereby the core competencies and expected learning outcomes of a graduate were identified and articulated. The main purpose of the MChiroMed program is to enable graduates to successfully pass the Federal Examination and

to complete the 2-year mandatory postgraduate program. Therefore, the core competencies and learning outcomes were discussed and finalized in agreement with the director of the Swiss postgraduate program. Six program core competencies (PCCs)—knowledge, clinical skills/clinical investigations, clinical diagnosis and management, communication, professionalism, and scholarship—were created, and program learning outcomes (PLOs) for each of the PCCs were articulated. Specific chiropractic courses then were identified from a review of the PCCs and PLOs, and the subject areas for each year of the program were outlined in reverse order. Each course was required to clearly state its PLOs in its syllabus and how teaching/learning would enable students to achieve these outcomes.

The MChiroMed program uses the “spiral curriculum” model as its central educational theme.<sup>8,9</sup> This approach was taken because students have relatively little time for chiropractic courses in the first 4 years, and therefore each succeeding year must reinforce knowledge and skills and then deepen and broaden students’ learning while integrating important medical learning. The major strength of the spiral curriculum is its ability to build upon previous learning, knowledge, and skills and encourage students to acquire deeper, more comprehensive understanding of the discipline.<sup>8,9</sup>

In most curricula, examinations and assessments drive student learning; therefore, the examination and assessment package (EAP) was viewed as a critical component of the MChiroMed curriculum.<sup>10-14</sup> The purpose of the EAP is to establish a link with the PCCs and PLOs and ensure that students have achieved them. Therefore, the EAP needed to consist of the most appropriate assessment methods for the PLOs being tested and to provide timely feedback to students to maximize their learning and correct any deficiencies or weaknesses. One of the strengths of the MChiroMed program is the ability to carefully monitor student learning almost on an individual basis within small cohorts. Therefore, the EAP includes, for example, a high proportion of *viva voce* examinations that are not possible with large student cohorts. Additionally, all written examinations include questions requiring short- to medium-length answers, which often necessitate integration and application of clinical information; examinations exclude multiple-choice questions of any form to allow testing of deeper learning, rather than mere knowledge of factual information.<sup>13,14</sup> Although only 1 examination/assessment per subject per semester is given to avoid examination overload and the EAPs are higher-order tests, this is not a difficulty for the high-caliber students who have been rigorously screened by the Medical Entrance Test.

### Bachelor’s Degree

The BMed (Schwerpunkt Chiropraktik) program consists of 3 years with 2 semesters of 14 weeks each year. Credits points are awarded according to the European

Credit Transfer and Accumulation System (ECTS). Sixty ECTS credits are awarded each year for a total of 180 ECTS credits for the Bachelor’s degree.

The focus of years 1 and 2 of the BMed program is on the healthy human, whereas in year 3 the focus shifts to the human in disease. Year 1 of the BMed program consists of foundational courses in the human and natural sciences, with lectures in the mornings and practical classes in the afternoons. Some of the courses include molecular cell biology, general chemistry and physics, genetics, histology, and embryology. Of particular interest for chiropractic students are courses addressing the natural sciences and the anatomical foundation of human medicine, functional anatomy, and the human neuromusculoskeletal system. Other important foundational courses for clinical practice are an introduction to psychosocial medicine, general medicine, biostatistics, and public health statistics.

In year 1, the mandatory Chiropractic Schwerpunkt module consists of a combination of lectures and practical classes for 2 h/wk for 28 weeks over the 2 semesters. Students begin with an introduction to the history and current state of chiropractic practice in Switzerland. After this introduction, students focus on the anatomy, radiographic anatomy, and biomechanics of the spine and soft tissues and chiropractic assessment and examination of the musculoskeletal system, including posture and gait. Students must observe and report on a minimum of 3 chiropractic practices during the second semester.

Year 2 of the BMed program comprises more in-depth study of human biology, anatomy, histology, physiology, and biochemistry. The courses are taught in morning lectures and reinforced with practical classes in the afternoons, and tutorials are reviewed at the end of the spring semester. Clinical anatomy theory and examination practical subjects are of special interest to chiropractic. However, most importantly, chiropractic medicine students are assigned to small groups that have the opportunity to visit ambulatory clinics and hospitals and see firsthand a variety of patient conditions.

In year 2, the mandatory Chiropractic Schwerpunkt modules again consist of lectures and practical sessions for 4 h/wk for 28 weeks in the fall and spring semesters. The chiropractic module consists of further discussions of the principles and concepts of chiropractic and the history, terminology, and classification of manual therapies. These discussions are followed by in-depth teaching on the biomechanics of joints, connective tissues, and muscles and practical work on examination of the joints and soft tissues of the extremities and the spine. Introductory treatment therapies, such as some mobilization, rehabilitation, and soft tissue therapies, are also introduced and practiced.

The second year of the BMed program is a difficult year with a heavy curriculum. Although we would prefer that students spend more hours per week in the chiropractic modules, our experience has shown that this increase would

overload students to an extent that would have a negative effect on their learning experience. As in year 1, students are required to observe and report on 3 chiropractic practices during this year.

As mentioned previously, year 3 of the BMed program begins a focus on humans in disease. The modules again consist of lectures in the mornings, followed by practical reinforcement classes in the afternoons. The fall semester lectures introduce clinical medicine and the respiratory and cardiovascular systems, and the practical classes introduce clinical history and general physical examination, general and special pathology, microbiology, and laboratory medicine. The spring semester presents lectures on the gastrointestinal tract and the digestive system, infectious diseases, the immune system and systemic disorders, reproduction and birth, and the locomotor system. The practical classes include courses in orthopedics, rheumatology, internal medicine, surgery, general practice, special pathology, and psychosocial medicine. As mentioned previously, our chiropractic medicine students are assigned to small groups that visit a variety of ambulatory and teaching hospitals to observe firsthand numerous patient conditions and expert medical practices. This experience offers a tremendous advantage as part of the medical curriculum and helps students integrate theory and practice, which encourages deep and comprehensive learning.<sup>15,16</sup>

In year 3, the mandatory Chiropractic Schwerpunkt module is delivered in lecture and practical formats for 6 h/wk for 28 weeks in the fall and spring semesters. The chiropractic modules consist of an overview of the anatomy and biomechanics of the spine, pelvis, and peripheral joints and an introduction to diagnostics and therapeutics of these areas. A series of lectures and practical classes on motor control of the spine and extremities is also included. Chest radiology is introduced, and this efficiently integrates with and follows on from the medical courses. Students are presented with a pro forma for assessment, diagnosis, and introductory therapy for spine, pelvis, and extremity disorders. Students begin to learn and practice in more detail performance of the different adjustment and manipulation impulses and some spinal manipulative techniques and more soft tissue techniques.

Again, students must observe and report on 3 chiropractic practices during this year. Chiropractic students who successfully complete all of the requirements of the BMed program are awarded the BMed degree (Schwerpunkt Chiropraktik).

### Master's Degree

**Master in Chiropractic Medicine I.** Year 4 represents the first year of the master's degree program. Chiropractic students continue to study all of the medical subjects during this year. The medical curriculum continues on the theme of the human in disease. In the fall semester, the lectures consist of clinical psychology and behavior, the sense organs (head

and neck), endocrinology, and the nervous system. The afternoon practical sessions include anesthesiology/general medicine II, internal medicine, neurology and neurosurgery, obstetrics and gynecology/pediatrics, otolaryngology, and psychiatry. During the spring semester, the morning lectures focus on blood and neoplastic disorders, medicine of different life stages (childhood, adolescence, adulthood, geriatrics), gastrourinary tract, dermatology, emergency medicine, social and forensic medicine, and ethics. The afternoon practical sessions offer courses in pediatrics, obstetrics, gynecology, neurology and neurosurgery, radiology, dermatology, laboratory courses on blood and neoplastic disorders, laboratory courses on the kidney, electrolyte and water balance, and emergency medicine. These medical practical sessions/courses are, undoubtedly, a huge advantage of the chiropractic medicine program over most, if not all, other chiropractic programs. Students are exposed to many clinical settings, ranging from hospitals to ambulatory clinics, and see firsthand a wide variety of patient conditions. Our students have opportunities to see expert practices and to participate in taking patient histories and performing physical examinations. Rather than reading about patient conditions, students are involved in the clinical encounter, which encourages development of deep and comprehensive knowledge that is necessary for successful clinical practice.<sup>13,14</sup>

Chiropractic medicine students must complete the 4 years of human medicine to take the written and practical medical examinations at the end of year 4. Successful completion of these courses and examinations allows our chiropractic medicine students to work in the university's hospitals and in other university clinics as under-assistants (UAs), similar to their student colleagues in human medicine. Program completion also allows chiropractic medicine students to learn how to engage in shared and collaborative practice in the future to optimize health care services and improve patient outcomes.<sup>17</sup>

In year 4, as in year 2, students are faced with a heavy curriculum load. In our experience, we have found that 7 contact hours per week for the chiropractic modules during year 4 is the maximum amount that these very bright and capable students can handle. Consequently, the chiropractic modules include 2 hours in diagnostic radiology, 1 hour in neuromusculoskeletal diagnosis, and 4 hours in chiropractic technique per week. The theme for year 4 is "diagnosis and treatment." Both the medical and chiropractic modules expose students to the underlying clinical signs and symptoms of disorders and diseases of various systems and the corresponding science-based treatments. In particular, the chiropractic medicine modules are centered on disorders of the neuromusculoskeletal system. The focus is on the spine and pelvis in the first semester and the extremities in the second semester. A special effort has been made to integrate and coordinate the timing and sequencing of the subject materials in relation to each other and to



integrate, as much as possible, with the delivery of material in the medical modules.

The master's degree requires students to produce a piece of research work called the "Masterarbeit." This research work is not at the same level as a master's dissertation but nevertheless is a considerable piece of work. During year 4, students are required to find a Masterarbeit topic and a supervisor and attempt to begin work on the Masterarbeit.

**Master in Chiropractic Medicine 2.** Year 5 is focused completely on chiropractic medicine and in particular on the science-based approach to clinical management of common chiropractic patient conditions, with an emphasis on safe, competent, and best practice. The diagnostic and therapeutic knowledge and skills developed in year 4 are further developed and integrated into an overall management strategy that is appropriate for the most common conditions chiropractors encounter in clinical practice.

The chiropractic modules for year 5 are as follows: Current Topics in Clinical Chiropractic, Clinical Problem Solving, Neuromusculoskeletal Diagnosis II, Chiropractic Technique II, Diagnostic Imaging II, Active Rehabilitation, Adjunctive Therapies, Radiography Physics and Practice, Introduction to Clinical Practice, and Advanced Chiropractic Diagnosis and Technique. A brief description of some modules that may differ from contemporary chiropractic programs is provided.

The module "Current Topics in Clinical Chiropractic" explores the scientific literature related to contemporary chiropractic practice, as well as timely topics that arise nationally and internationally and are relevant to chiropractic medicine. Students have an opportunity to search for, discuss, and critically evaluate the body of research evidence that underpins the chiropractic profession and chiropractic patient care.

The module "Clinical Problem Solving" introduces real-life chiropractic patient histories, examination findings, diagnosis, treatment and management protocols, and outcomes. Most cases are taken from patients who presented to the Chiropractic Teaching Clinic or to faculty/supervisors. Students are given pertinent information in stages that require them to work through the information, ask additional clinical questions, formulate a routine for examination, arrive at a differential diagnosis or working diagnosis, and develop a management plan with specific treatments. A senior faculty member discusses and works through each case with students, and time is allocated for practicing all phases of clinical assessment and some manipulation options.

The module "Diagnostic Radiology" is a typical chiropractic subject, but the teaching approach is not typical of most other chiropractic institutions. Students are given interactive lectures and practical, interactive classes/tutorials with a senior chiropractic radiologist. The radiology modules are case based and integrate clinical history and examination findings. All examinations are short-answer, image-interpretation assessments that require management decisions.<sup>13</sup> Similar to "Clinical Problem Solving," these modules afford students the opportunity to put together the knowledge and skills essential for the entire clinical encounter with the patient.

The module "Neuromusculoskeletal Diagnosis II" is not unique to the chiropractic medicine program and comprises lectures and practical classes that include real patients with the conditions that are being studied. The module is taught by experienced chiropractors who are also medically qualified in psychiatry and rheumatology. This module provides students with a wealth of clinical knowledge, skills, and experience and the opportunity for practical applications with real patients.

"Introduction to Clinical Practice" takes place in a busy, local chiropractic practice. Students attend the practice and are given the opportunity to take clinical histories and perform physical examinations on real patients at the multidocor practice under the supervision of a senior experienced chiropractor and teacher. Students are then required to write up the cases and present or submit them to the senior chiropractor for feedback and advice.

The module "Advanced Chiropractic Diagnosis and Technique" is a series of workshops presented by medical and chiropractic professionals who have particular expertise and experience in different aspects of clinical practice. For example, workshops on geriatric and pediatric chiropractic practice are offered, as are sessions on different chiropractic techniques, neural therapy, functional neurology, and even a revisiting of clinical anatomy. Some of the workshops involve students attending chiropractic practices and observing or taking part in clinical assessments.

At the end of year 5, students must pass the clinic entrance examination to advance to year 6. The clinic entrance examination comprises a combination of a written diagnostic radiology examination and a 10-station objective structured clinical examination that includes simulated patients.

**Master in Chiropractic Medicine 3.** After the chiropractic medicine students have entered the sixth and final year of the program, they are called UAs, similar to their student colleagues in human medicine. UAs work in a university hospital setting—in our case, the University Hospital Balgrist. Year 6 comprises 5 months in hospital department rotations and 6 months in the chiropractic teaching clinic (Policlinic). The student cohort is divided into 2 groups, 1 group starting in hospital rotations and the other group in the Policlinic. Half way through the academic year, the 2 groups exchange roles. During this year, UAs are expected to give a scholarly presentation of their "Masterarbeit," plan and participate in a journal club and a specialty workshop, and attend other scheduled workshops. Thanks to an excellent relationship with the Radiology Department of the University Hospital Balgrist, our UAs are given private weekly sessions by musculoskeletal radiologists on a rotating basis. Our UAs also participate in "Rheumatology Grand Rounds" on a monthly basis and in bimonthly private Grand Rounds that are conducted for our UAs by an internationally renowned neurologist. These experiences provide invaluable opportunities for our UAs to increase their clinical knowledge, skills, and expertise.

For the hospital rotations, our students spend 8 weeks in orthopedics (4 weeks in spine orthopedics and 4 weeks in

extremity orthopedics), 5 weeks in rheumatology, 4 weeks in neurology/paraplegiology, 1 week in radiology, 1 week in internal medicine, and 1 week in preparation for entering the Policlinic. The hospital rotations expand the clinical knowledge, skills, and experience of the UAs through observation of expert medical practice for patients with a variety of common locomotor conditions who present to a musculoskeletal university hospital; rotations also allow students to assist, as needed, in clinical encounters with patients, whether they be outpatients or inpatients, and residential or surgical cases.

The Chiropractic Policlinic is part of the Orthopedic Department of the University Hospital Balgrist and focuses on applying to patient care the diagnostic, therapeutic, and management knowledge and skills learned in previous years. Students diagnose, treat, and manage patients under the supervision of qualified chiropractic supervisors. The Policlinic has developed an excellent relationship with the medical departments in the hospital, most likely as a result of the exemplary behavior, knowledge, and skills of our chiropractic medicine UAs during their hospital rotations. Indeed, we have received many compliments on the clinical training, energy, and enthusiasm of UAs. The Policlinic receives a high percentage of patient referrals from the hospital, mainly from spine orthopedics. Most of these patients have chronic conditions for which medical care has largely been unsuccessful. Although these patients present with many comorbidities and a long list of diagnoses, our UAs, under expert chiropractic supervision, are able to provide improvement and relief of symptoms in a large percentage. This success, in turn, leaves a positive impression on the referring medical doctor and his or her department, reflecting the value of chiropractic care in the hospital setting.

With a high number of patient referrals from the hospital and a small number of UAs, the Policlinic is able to set a high minimum target for number of new patients and follow-up patient visits for our UAs. Currently, our UAs must see a minimum of 80 new patients and 800 subsequent visits over their 6-month Policlinic placement. Typically, our UAs are able to see over 100 new patients and 900 subsequent visits; thus far, no UA has been unable to meet the minimum requirements. The ability to meet patient and follow-up visit goals is a huge benefit of being integrated within an excellent and supportive university hospital and its musculoskeletal department. Historically, for chiropractic colleges, chiropractic teaching clinics have faced enormous difficulties in attracting sufficient numbers of patients for students to treat and manage. The Policlinic, however, has been one of the huge benefits of being integrated within an excellent and supportive university hospital's musculoskeletal department.

## ADVANTAGES AND CHALLENGES

The MChiroMed program offers many advantages and opportunities. The program is fully integrated within the medical curriculum of the Faculty of Medicine at the

University of Zürich and is located within the internationally recognized University Hospital Balgrist and its musculoskeletal department. As part of a world-class university and medical school, students and faculty have access to world-class academics, researchers, facilities, and resources. Our experience suggests that opportunities for academic and research collaborations are almost infinite. In fact, the number of opportunities for research collaboration exceeds our ability to pursue them.

Our students obtain 4 complete years of expert undergraduate medical education, most importantly including early and continued contact with a wide variety of patients in ambulatory and hospital settings. This patient contact has traditionally been a deficiency of chiropractic education worldwide. Early and continued patient contact supports integration of theory with practice; provides a deeper understanding of the underlying mechanisms of diseases/disorders and their clinical manifestations; and broadens knowledge, skills, and experiences through observation of expert clinical practice.<sup>13-16</sup> Chiropractic research has shown that students in traditional chiropractic programs that do not offer these experiences and opportunities fail to demonstrate appropriate learning for future clinical practice.<sup>13,14</sup>

Gaining entry to the MChiroMed program is difficult. The medical entrance examination sets a very high bar, which has its disadvantages. With a failure rate of 4:1, it is difficult to find a sufficient number of capable prospective chiropractic students who can pass the examination. The benefit we have seen is the enrollment of intelligent, motivated, responsible, and very capable students who learn quickly and completely with little time needed for remediation, which allows faculty to concentrate on enriching students' learning rather than focusing on students who likely should not be there. Closely tied to this benefit is the small class size (a maximum of 20 students). Faculty members come to know students on a more personal level and have more control over the students' learning progress. Small class size is important for chiropractic technique classes, as the instructor is able to keep a very close eye on students' skill development and provide early remediation for any deficiencies that are recognized. Small classes sizes, however, have the disadvantage of having fewer students for practice sessions; this results in more physical stress on each student because of the need for repeated practice setups and spinal manipulations.

The MChiroMed program attempts to integrate the best of chiropractic with the best of human medicine. Because students are required to take 4 complete years of medicine modules along with chiropractic (Schwerpunkt) modules, they are overloaded with information and work, particularly in years 2 and 4. We have identified this problem and have tried to find solutions, but a curriculum change does not seem possible at this time. We are constrained by the medical curriculum and the need for our students to qualify as UAs in the final clinical year. Nevertheless, because our students are very bright and qualified, most are able to make it through these difficult years.

Early in the history of the MChiroMed program, a common criticism of some Swiss chiropractors was that our students would be “medipractors” rather than chiropractors, as Switzerland has a greater scope of practice, including limited prescription rights for pain medication and muscle relaxants. These chiropractors cited the influence of 4 years of medical education and working within a hospital in their critiques and suggested that being part of a small group within a large medical student body would afford less opportunity to develop a chiropractic identity. Chiropractic identity initially was also a concern of ours. We have worked with local and national chiropractic organizations to develop ties for our students, starting in the first year with a chiropractic mentor. Students also are invited to social and academic events of chiropractic associations, free of charge; furthermore, as previously mentioned, students are required to visit 3 chiropractic practices for structured observations during each of the first 3 years of study. Finally, chiropractic students have been very proactive in forming a Swiss Chiropractic Student Association that is engaged in social, academic, and travel activities.

Finally, the Polyclinic has been successful in attracting an excellent number of patients for our UAs to treat. These patients typically have chronic ailments and have undergone all available medical treatments. The vast majority of patients are not referred to the Polyclinic for more medical treatment; rather, patients are referred to see if chiropractic can provide the relief and improvement that they have not been able to receive elsewhere. The University Hospital Balgrist has over 20 years’ experience with chiropractic because it has been one of the designated hospitals for German-speaking graduate chiropractors to carry out their 4-month orthopedic and rheumatology rotations in the mandatory postgraduate (residency) program. Consequently, many of the common challenges of integrating chiropractic within a hospital setting, such as professional identity, perceptions, and treatments given, have been overcome.<sup>17-20</sup> Our UAs are doing well in treating these difficult patients with chiropractic care instead of more medical care. As a result, when they graduate, our students will have had excellent experience in managing difficult patient conditions by using chiropractic medicine. The collective experience of our graduates in managing difficult chronic patients is an advancement in chiropractic education and practice that should not be underestimated. As increasing numbers of MChiroMed graduates enter practice, they will have the knowledge, skills, expertise, and experience to be the true “spine care specialists” and to engage confidently and successfully in the difficult area of managing chronic spinal pain, which is the most common, costly, and disabling problem in society today.<sup>6,7</sup>

#### LIMITATIONS AND FUTURE EDUCATIONAL RESEARCH

This paper is a description of the work we have done so far to develop these programs at one location. Educational

research will need to be performed to measure and confirm whether we are reaching our goals or not.

With such a unique chiropractic curriculum and educational environment, the MChiroMed program could be a rich source of educational research. Unfortunately, because of severe demands on a very small faculty, this research has not currently been possible. However, in the future, it would be interesting to survey graduates in practice on their perceptions of how well the curriculum prepared them for the rigors of the 2-year postgraduate program and their subsequent chiropractic practice. Also, a survey of practice mentors (“Principals”) should be conducted to compare the knowledge, skills, and competence of MChiroMed graduates versus graduates from other chiropractic programs. Other research could focus on developing and maintaining students’ chiropractic identity in the context of a large medical school and the coping strategies students use to survive an overloaded curriculum.

#### CONCLUSIONS

The MChiroMed program represents a unique spiral curriculum for chiropractic medicine embedded within 4 years of medical curriculum at a top medical university and housed at the musculoskeletal department of a university hospital. The advantages of the program include integration of the best clinical knowledge and skills from medical and chiropractic education and practice. Small student cohorts facilitate teacher–student interaction and supervision and the implementation of higher-order examinations and tests with timely student feedback. Early patient contact and development of clinical skills integrate theory and practice and, in particular, the preclinical and clinical sciences. A significant advantage of the program is the final clinical year, during which UAs go through a variety of hospital department clinical rotations and gain experience in treating and managing patients in a busy and successful chiropractic outpatient teaching clinic at the musculoskeletal hospital. Some of the challenges faced by the program include recruitment of a sufficient number of students who pass the difficult medical entrance test for the chiropractic program, an overloaded curriculum, and creation and maintenance of a chiropractic identity within a large medical school. We hope our future graduates will establish themselves as the primary spine care experts in Switzerland and further develop opportunities and facilities for integrated, interprofessional, and collaborative practices.

#### FUNDING SOURCES AND CONFLICTS OF INTEREST

Authors are administrators and faculty members of the Chiropractic Program at the University of Zürich.

## CONTRIBUTORSHIP INFORMATION

Concept development (provided idea for the research): B.K.H.  
 Design (planned the methods to generate the results): B.K.H.  
 Supervision (provided oversight, responsible for organization and implementation, writing of the manuscript): C.P.  
 Data collection/processing (responsible for experiments, patient management, organization, or reporting data): B.K.H., C.P.  
 Analysis/interpretation (responsible for statistical analysis, evaluation, and presentation of the results): B.K.H., C.P.  
 Literature search (performed the literature search): B.K.H., C.P.

Writing (responsible for writing a substantive part of the manuscript): B.H.K.

Critical review (revised manuscript for intellectual content, this does not relate to spelling and grammar checking): B.K.H., C.P.

**Practical Applications**

- The Master in Chiropractic Medicine is a unique, fully integrated chiropractic curriculum within the University of Zürich medical school.
- High-level academic and clinical education is provided within a world-class university and medical school.
- Early patient contact reinforces theory of basic science with clinical practice.
- Small cohorts encourage better-supervised learning with more appropriate assessments and timely feedback.

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